

**JOSHUA LEDERBERG**

1230 YORK AVENUE - NEW YORK, NEW YORK 10021-6399  
(212) - 327-7809

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To: David Gakenheimer:

Subject: Comments on TMD Blue Ribbon Review Report

I have read the summary with great interest and concur in every detail on which I can claim expert knowledge. In particular, I would strongly endorse NOT using live pathogens in field oriented trials. This will not only attract very difficult political attention; it will also greatly complicate the execution of the tests. Of course relevant parameters, comparing anthrax with other spore-formers in response to heat, radiation, etc., should and can be carefully measured in small laboratory scale experiments.

There are some underlying assumptions about decay of biological agents in the atmosphere (apart from kill mechanisms by the interceptor) that are not well understood. For example, the estimated LD-50 for anthrax has been estimated at about 10,000 spores. This is sometimes misread as an abrupt threshold, that there is zero likelihood of infection with, say, 1 spore. If, as is more likely, the biological response is probabilistically proportional to the dose, then 1 spore will have a likelihood of infection  $\sim 10^{-4}$ , a small cross-section, but one that can not be ignored for large populated targets. That is to say, in contrast to chemicals, mere dispersion and dilution is no comfort: it may however allow more time for active kill mechanisms to take hold.

In that regard, we must also consider scenarios in which attacks are made at night or in heavy overcast; and also the microencapsulation of biological agents to afford them UV-protection.

These perspectives are consistent with the report, but perhaps might be highlighted.

Yours sincerely,

Joshua Lederberg

